

AMENDMENTS TO THE CLAIMS

Claim 1 (Cancelled).

2. (Currently amended) ~~The electric power steering apparatus as set forth in claim 1,~~ An electric power steering apparatus for converting the rotation of a steering assist motor into the movement of a steering shaft in the axial direction thereof in accordance with steering operation by using a ball screw mechanism wherein a female thread groove formed around an inner circumference of a rotating cylinder rotated around the axis thereof by said steering assist motor and a male thread groove formed around an outer circumference of said steering shaft are screwed with each other via a plurality of balls, wherein

portions of cross-section, where said female thread groove and said male thread groove contact with said balls, are formed in a circular arc shape, respectively, and

a curvature of said female thread groove is smaller than that of said male thread groove;
wherein

a curvature radius of said female thread groove is in the range of 53.5 to 85% of the diameter of said ~~ball~~ balls, and

a curvature radius of said male thread groove is in the range of 52.5 to 75% of the diameter of said ~~ball~~ balls.

3. (New) The electric power steering apparatus of claim 2 wherein the curvature of a bottom of the male thread groove is not less than the curvature of said balls.

4. (New) An electric power steering apparatus for converting the rotation of a steering assist motor into the movement of a steering shaft in the axial direction thereof in accordance with steering operation by using a ball screw mechanism wherein a female thread groove formed around an inner circumference of a rotating cylinder rotated around the axis thereof by said steering assist motor and a male thread groove formed around an outer circumference of said steering shaft are screwed with each other via a plurality of balls, wherein

portions of cross-section, where said female thread groove and said male thread groove

contact with said balls, are formed in a circular arc shape, the apex of said circular arc shape being the bottom of each thread groove, respectively, and

a curvature of said female thread groove is smaller than that of said male thread groove.

5. (New) The electric power steering apparatus as set forth in claim 4, wherein
a curvature radius of said female thread groove is in the range of 53.5 to 85% of the diameter of said balls, and

a curvature radius of said male thread groove is in the range of 52.5 to 75% of the diameter of said balls.

6. (New) The electric power steering apparatus of claim 4 wherein the curvature of the bottom of the male thread groove is not less than the curvature of said balls.

7. (New) An electric power steering apparatus for converting the rotation of a steering assist motor into axial movement of a steering shaft in accordance with a steering operation, the electric power steering apparatus comprising:

a rotatable cylinder surrounding a portion of the steering shaft, the rotatable cylinder having a female thread groove formed around an inner circumference of the rotatable cylinder, the rotatable cylinder being rotatable by a steering assist motor;

a male thread groove formed around an outer circumference of said steering shaft; and

a plurality of balls in the male thread groove and the female thread groove between the rotatable cylinder and the steering shaft, wherein:

the female thread groove has an arc-shaped bottom, having a first curvature, contacting said balls and the male thread groove has an arc-shaped bottom, having a second curvature, contacting said balls;

wherein said first curvature is less than said second curvature.

8. (New) The electric power steering apparatus as set forth in claim 7, wherein
a curvature radius of said female thread groove is in the range of 53.5 to 85% of the

diameter of said balls, and

a curvature radius of said male thread groove is in the range of 52.5 to 75% of the diameter of said balls.

9. (New) The electric power steering apparatus of claim 7 wherein the second curvature is not less than the curvature of said balls.